Menlo Park Notebook #86 [N-79-09-18]

This notebook covers the period September 1879-January 1880. The entries are by Edison, Charles Batchelor, and James Seymour. The book contains notes on telephone experiments and lists of telephones packed and shipped to England and elsewhere. The label on the front cover is marked "Telephone" and "New Receiver." The book contains 266 numbered pages.

Blank pages not filmed: 136-138, 143-155, 176, 179-191, 222-245.

Missing page numbers: 139-142, 145-146, 177-178, 211-212, 227-228, 247-248, 251-254, 257-260.

No 86

LIBRARY OF THE

BOARD OF PATENT CONTROL,

120 BROADWAY, NEW YORK.

[illegible]

GENERAL ELECTRIC

[illegible] Broad St. N.Y. C.

May 1, 1896

No 86

44 vs Edisons Experimental Inst

We find that the reason we cannot adjust the hammer of the transmitter out far so as to get it loud is that when adjusted to get very loud talking that there is a reciprocal action between the receiver and the transmitter locally & also between the two stations, and this action causes squeaks, & microphonic effects leaving the impression that the fault is all in the transmitter being to delicately adjusted whereas

its not the fact, because when
the transmitters at both ends
are adjusted so that the talking
is all scrape squeak & rattle
& scarcely intelligible the stoppage
of the Receiver handle when
transmitting its comes
Clear & loud and the transmitt
may still be further adjusted
out, The action is this when
turning Receiver, on closing
push Button the receiver
diaphragm gets a Knock
this is transmitted through
the air and through the

brackit to box & thence to transmitter
which gives a wave this wave
reacts on the receiver which
retransmits to the transmitter on so on
giving a perfect squeak in the
act of talking the receiver
diaphragm of course works and
these waves retransmitted through
air & arm to transmitter
produce a confusion of rattle &
squeak rendering the talking
inarticulate at the distant
station & also creating the
impression that the transmitter
is adjusted out too far.
Again in addition to this
reciprocal action locally

There is reciprocal action between the terminals thus on closing push button the receiver sends a knock locally & the distant receiver sends a knock to its transmitter the two transmitters retransmit this knock hence squeaking

If Batchelor is turning & I am also my push button acts on his own instrument the same as his own though not so strong.

We took arm off of instrument held it in hand 2 feet away the talking was

loud + perfect upon an
adjustment which we couldn't
understand. scarcely a
word with the arm screwed
to base, We then worked
push button, and brought
receiver within one inch of
mouth of transmitter still
holding in hand ~~an~~ closing
push button and giving an
initial knock we obtained
a musical note which only
stopped when receiver was
2 1/2 inch away. the closer
the receiver to transmitter

the higher the note,
on putting the arm on wall
3. feet from transmitter base
we got a reciprocal note,
it interfered badly with
talking when put on
wall 10 feet away.
All these Effects are done
away with when a back
point is put on push button
to open receiver when talking
no reciprocal action can
take place Cho Mangui

is enormously increased
we find that the idea of
wanting facilities for
interruption is nonsense. as
in NY your own voice drowns
the interruptions + they always
wait until you are through
with sentence, In England
where they pause he has to
be taught they can be
taught one way as well
as another = another
increase in Margin

by this device is due to
the opening of the tertiary
thus preventing to some
extent the shortcircuiting
of the transmitter wave
in its own coil,

We find that the Wallace
Carbons have more margin
for adjustment & work
better than Jablockoff
this is explained by looking
at them under the Microscope
the Wallace Carbons are
composed of particles

More finely divided than Gobalkoff - on a fire test we find the latter contains impurities there oozes out a brown stuff totally obscuring the Carbon particles, in Wallace only a very little white stuff comes out, the resist of Gobackoff is 40/100 of an ohm while Wallace is but 23/100 another point in its favor

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We find that when the springs in the chalk form a groove sideways (ie) more on one side than on the other that the rubber presser may have a slight Cant given it so as to increase the pressure on the side where it shows deficiency in this way we make perfect grooves

---

We find that it is preferable to wet the Chalk in the manner as when damp ~~the~~ chalk before the water fairly gets in is in a soft state & the palladium makes a nice groove in the act of wetting

when fruit first they
palladium does not generally
at least for a long period)
make a nice groove.

Chas Batchelor
Page 1-21

16 | 480 / 30

9 | 16 1.77
16

9 | 480 / 53

.88

7/8 chalk
1/8 Sat. Sol

18 = 16 / 2 / 14 (.77 / .11 2.5
18 | 2.00 / 1.8 / .20 .77 / 3

18 = ~~11~~ 16 / 2
18 | 140 / 126 / 140 .77

$\frac{1}{12}$ ʒ = 40 minims

as 75 : 100

25 % Sat

2.5 of what Chalk receives

= 1 min = solid matter

60 min

6 ~~min~~ Solid matter

1½ ¼
2"

45 minims in each ℥ of 75 pc sol

¼
1
1½

45
16
270
45
720
1440
180 | 1440

2
8
3 | 12

1' 12 | 480
240
120
60
15
75

90 minims to chalk

90
16
1440

75 Sat
15 water

1 : 2

1½ ℥
1 ℥

75 : ~~25~~ 22½ · 2

75 minims Sat. Sol. phos Soda
15 " Water

Of 90 minims going in chalk
75 % or 67½ of Sat.
25 % a 22½ of Water

2℥ of 75% concentrated P.S.

1 ℥ Chalk.
50 pc Sat.
1℥ of Saturated
1½℥.

480
2½
960
240
1200

90 | 1080
960
180

1 ℥ chalk
2℥ Sat. Sol
½ ℥ water

120
60

Sept 18. 2 AM 1879

Chalk cylinders — Chas Batchelor

We find that chalks must be wet with a solution of
75% of Phos. Soda. Sat. Sol.
25% water
and to every 1 oz button there must be 90 minims of solution put in, but as we turn away a great part of the Chalk we must put in the same percentage of the 90 minims as there is percentage of the Chalk left after turning

We pressed up some cylinders as follows: —

1 oz chalk pressed to 7/8 talks decent.
" " " " 1 washer more same
" " " 2 " " much louder
" " " 3 " " same
" " " 4 " " same
" " " 5 " " same
" " " 6 " " about same

These were now left till Nov 18th 2 pm when all but the first had deteriorated and that was as good as the 3rd was at first

Chas Batchelor

Chalk Cylinders Sep 18th 4am 1879

Chas Batchelor

Made 5 pair of chalks of old formula

2 ℥ Chalk
$\frac{1}{4}$ fluid ℥ Sat Sol. Phos. Soda

These were wet whilst in the instruments with 15 minims of a solution of

50 pc. Sat Sol. Phos. Soda
50 pc Water

Each of these was made by weighing out 1 ℥ of the mixture and pressing with 3, 4, 5, 6, & 7 washers.

Chalk with 3 washers talks pretty fair
" " 4 " " little better
" " 5 " " " "
" " 6 " " good
" " 7 " " red hot

~~In this 7 washer one it took more pressure to fetch down the same to the~~

~~head than in the pure chalk and still it was softer: this must be due to the fact it has some water in~~

28. is one that measures well but cant get any shock except on tongue. Kruzi takes it apart

45 - Red Hot shock
29 - Fair, not so good as 45
39 . Hot
49 . Hot not so good as 50.
35 - good not so strong as 45
32 - No good weak
50 — Hot
51 . Hot
25 - No good - bad weak

34. Palladium Chalk not flat got a high place in it makes a narrow track. in two ~~rings~~ rings $\frac{1}{16}$ wide Each ring $\frac{1}{32}$ =

52 - got bad turning mechanism
it will do but is not nice

Telephone Sept 30 1879

Nos. 42. 47 45 41 48 49
30 39 32 34 31 51 50
52 25 36.

All sent to London today

These were all very loud talkers no difference between any of them all new transmitters with diaph. adjustment

Chas Batchelor

Telephone Oct 1st 1879

Tested

43 Bully O.K. Paraffine wired core
talks very loud – up to standard

46 O K. Paraffin wire core
this is very good but a
shade low at 3 inches
away.

33 O.K. Bang up.
up to standard

28 O.K. Bang up
up to standard

Chas Batchelor

29 OK – Bang up
Up to Standard

24 O.K. a little low at first
but brought up to Standard
by turning backwards
and fwd for some time

26 OK Bang up

35 OK this one had a coil
in it that was measured
and marked '40 primary —
afterwards Francis measured it
in the box '25 & when took
out he measured it '41 again
put another in and it was O.K.

Telephone Oct 3 1879

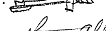
Chas Batchelor

Telephones 37 to 40 were put up and tested to-night. They worked elegantly and were taken by Rose to London Oct 4th 1879

Two telephones were given to Bergman for models they worked elegantly right off

46

Telephone Oct 15 1879 47

35 Telephones No. 85 – 119 inc –
sent to London today –
In testing them we find them
all a little lower than they
ought to be but very good
We sent 23 on Oct 9th which
were all low on testing but
when we put in 
the ritted Spring they all
belched right out —
We cannot at present account
for the fact that these 35
are a little lower than standard

Chas Batchelor

lephone — Oct 15th 1879

We pressed some chalks from new mould (that is the one made for the small chalk) and in order to get the right pressure we ~~took~~ ~~[illegible]~~ a chalk moulded in large mould and turned the diameter to fit the small mould and weighed the chalk —

We now put in same weight and pressed to same thickness. This however seemed to make a softer chalk and it did not work loud. Weight exactly 1 oz troy.

We now put in 1 oz 3 dwt and

pressed to same thickness
These talked right loud before wetting and fairly belched afterwards

We now took 2 more chalks of 1 oz weight and the first talked very low before wetting (much lower before wetting) after wetting it came up very loud in fact a belcher compared to the 36 tested yesterday the second I put more pressure in the polishing operation and it talked moderately before wetting but was exceedingly loud after ——

The difference between these

two Chalks and the two on page 49 of same weight is only that those on page 49 were used immediately after moulding and the latter two were allowed to stand 1½ hours before turning up

---

We now put in 1oz 1dwt and it came loud before wetting and after wetting was perfectly damned-horribly loud

We now put a 1oz 2dwt and it ~~came loud b~~ talked moderate but uneven before wetting after wetting it did not increase it much

We now put in 1 ʒ 3 dwt
these dont 'belch' like the
ones of same weight on page
49 - We cannot understand
the reason why - These were
turned by steam instead of
foot power & had marks on
one side owing to the lathe
being out of balance - These
gave a sound similar to
a phonograph when after
~~sett~~ making a good record
was not set in deep enough
in reproducing

elephone

Oct 16 3 AM 1879

We now put in 1 oz weight mixed much better in fact Thoroughly elephone.

Oct 16th 10 pm
1879

Chas Batchelor

We now began a series of experiments to extend over a length of time, making 2 chalks of a kind and keeping them under glass jars:—

No 1 Moulded from large mould turned with a glazé polish by perhaps a dull tool — came moderately loud without wetting, after wetting & turning they came first class belchers — mark white — shows no cutting of Palladium — peculiarity of these chalks is that with certain pressure

the more you turn the harder
they go — that is friction in-
creases. this is what we desire
~~They~~ These were will ground before
pressing and weight 1oz 15dwt

No 2 These were 1oz 17dwt
Before wetting twice as loud as
No 1
After wetting - not much louder
if any than No 1 and about
2/3 louder than before wetting
These do not talk so loud
at 3 inches away as No 1

---

3 These were made excactly
as No 1 — they are equal at
3 inches but not quite so

loud in the mouthpiece
Talking seemed to be sharper
but not quite volume, whether
this be due ~~to~~ chalk or trans-
mitter, Cant ~~say~~ — These Chalks
had no glaze consequent~~ly~~ on
Martin grinding the tool ——
We now find by altering the
transmitter a little that these
No 3s are exactly equal to
the No 1s — We find that
turning the chalks by hand
and getting no tool marks on
surface, gives us the increased
friction ~~by turning~~ which
is so necessary to good working
chalks.

Oct 17th 8 AM
1879

No 4

These chalks were 1oz 16dwt — before wetting talked quite loud — after it was a regular 'belcher' at ⅜ inch away same as No 1

Chas Batchelor

Wet

133
143
135
132
142
124
129
126
129 - wants new Chalk -
138 ~~[illegible]~~ -
121
120
122
139 - 130
131
123. 154 - new Cat-Trans not a [illegible]
" "
137 150
" "
136 166 " " " "
128 149 " " "
148

---

130 - not wet
134 - wet - not set right or have new chalk - duty I
137 - Moderate Talker -
141 Little better than moderate,
140 Fair. better than 141.
122 Moderate. Lit bet -
120 Fair = Transmitter bad wants looking after - Batch says too low -
133 - nearly a Belcher - OK -
143 Moderate Belcher. OK
135 Fair OK -
132 Nearly Belcher OK
121 - Probably no button in Transmitter
128 Moderate - Think primary crossed - whether opened or closed talking perfectly loud - when you push hand on push - makes loud kick in Receiver

142 - moderate (very) - Batch
dont get me loud -

124 - Moderate, makes scarcely
any dif whether primary
opened or closed -
Batch gets Trans good

---

129 - Too low - Batch gets
Trans good -

---

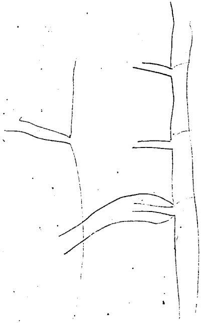
126 - Fair, —— ok
Batch gets trans ok

---

39 Fair - wants new Receiver handle
button - otherwise OK -

---

31 Fair - Ok - Batch Says
its best trans. yet = This first
one I heard my own voice loud -



127 - Moderate -

136 - Nearly a Belcher - OK

all of these numbers
oz 15 pennyweight - burned & put
in ethylene 2 days -

New Lot -

oz 16 pennyweight - burned
put in [illegible]

162 - Belcher OK - Pocked

163 - Belcher. OK - Pocked

152 Mod Belcher Pocked

153 - Belcher OK -
I notice a rattle like loose
Mica in Receiver. But dont
hurt. Packed.

---

160 - moderate - Batch says
Trans N.G. acts funny - see to
it - perhaps, Coil bad -

---

149 - Reg Belcher OK Packed
Batch gets good Trans.

---

168 - Belcher OK
Batch gets good Trans Packed

---

165 - Belcher OK Packed
good Trans

---

164 - Belcher — OK ; Packed
Trans not extra good

159 – Belcher Pocked

---

169 – Belcher Pocked

---

158 – Belcher Pocked

---

151 – Belcher Pocked

---

157 – Belcher Pocked

---

145 Belcher sent
upstairs to Botch. To
use as test instrument

---

144 Belcher Pocked

---

161 Belcher Pocked

146 — awful Belcher [illegible] Packed

155 — awful Belcher Packed

156 - Belcher Packed

167 - Rattles & Chalk has low spot in it.

137 - moderate - low.

127 - Want new Chalk

136 - Moderate Belcher

130 - Belcher Packed

~~154 - Fair - closing or opening push makes no differ~~ Belch gets ~~trans~~ Red hat after 2 days - Belcher

---

131 - Belcher Packed

---

150 - new lot = Fair - Trans good
This is funny would tend show that polishing first + then within 9 N.G. -

---

132 - Belcher Packed

---

128 - Moderate Belcher OK
Packed

---

160 - Mod Belcher
Trans N.G. Batch to look at it =

~~136 - Belcher~~

~~127 - Belcher~~

126. Belcher, mod -
Packed

124 - Mod Belcher
Packed

129 Mod Belcher
Packed

142 - Recem Mod Belcher
Trans Low.

135 Belcher
Packed

143 - Recem Moderate,
Trans good

133 – Recvr poor
Trans good

166 – Reg Belcher
Pocket

149 – Recvr Belcher
Trans - Batch get
nothing bug in it

148 Belcher
Pocket

123 – Reg Belcher
Pocket

138 – Belcher
Pocket

120 - Belcher -
Packed

122 - Belcher
Packed

139 - Belcher
Packed

141 - Awful Belcher

140. Awful Belcher

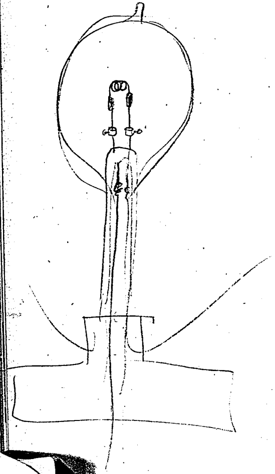
[illegible]

154. Belcher

	R	L	I abt
167	.36	133	429
150	.37	135	357
160	.40	142	280
149	.37	142	490
143	.37	140	375
137	.38	144	425
	.39	143	430
127	.36	129	387

Oct 28.

154- Belcher
121 Belcher.
127- Belcher.
137 Belcher
166 Belcher
149 Belcher
167 Belcher when primary open but this one shows difference of opening and closing primary more than any of them excellent however



143 Not a Belcher
Transmitter good
~~better good~~ fair

150 Belcher

133 Belcher

125 Belcher

142 Belcher but
bad transmitter

134 – not a Belcher
wait till ring try

127- put new chalk.
Belcher, Pack
for Bentley).

137- Belcher
Pack for Bentley

Over

Barker took. N°
134 & 149 –

170 Belcher
Tested Nov 1st 1879.

171 Relay Instruments
& 172 for Lighthipe.

— wants new chalk
143 - new chalk
197 - Bad Brass
212 Bad chalk & worn
— Saladin flat
178 shaft untrue,

Nov 6th 1879

Put up on the wall
~~tax~~ 16½ chalk wet with
15 cent of water to 8 oz
hence this has harder pressure
than reg ($16\frac{1}{2}$ H_2O) - Test inst

Nov 7th 1879

No 190	Wett
" 202	wet
" 189	wet
" 187	wet
" 188	wet
" 186	wet
" 176	wet
" 173	wet
" 206	wet
" 211	wet
" 179	wet
" 184	wet Bad chalk [illegible]
" 185	wet
" 143	wants new chalk
"	wants new chalk
" 181	wet
" 182	wet
" 175	wet

6 - 8 oz

Number wet 30 Machines

Nov 9th 1879.

No 174 Test
" 183 Test
" 177 Test
" 195 Test
" 196 Test
" 204 Test
" 208 Test
" 197 Test
" 194 Test
" 192 Test
" 191 Test
" 193 Test
" 205 Test
" 199 Test
" 201 Test
" 198 Test
" 207 Test
" 210 Test
" 212 Bad Chalk Palladium
(probably not flat
No " 211 Test
" 213 Test
" 209 Test
" 203 Test
" 178 Shaft central.

Standard Belcher (Sunday - 2 days up) Fearful - Loud Best ever had.

No 206 - Ok Belcher pack

---

173 - Not a 1st Class Belcher Keep it for Chili: Relay

---

176 - Ok - Belcher red hot. Pack

---

186 - Ok - Belcher pack -

---

188. Ok Big Belcher.

---

187 - Ok Big Big Belcher

---

189 Ok Belcher

202. - Ok Belcher

190 - Ok big Belcher

200 OK Big Belcher;

179 - OK Big Belcher

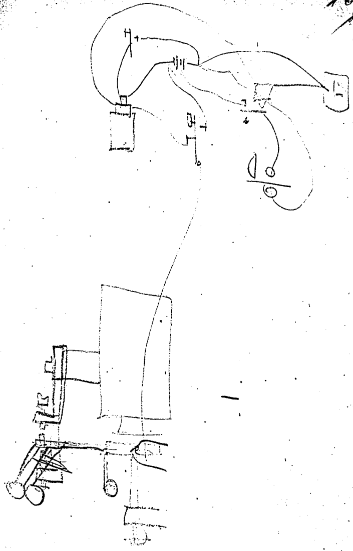
184 - Ok Belcher

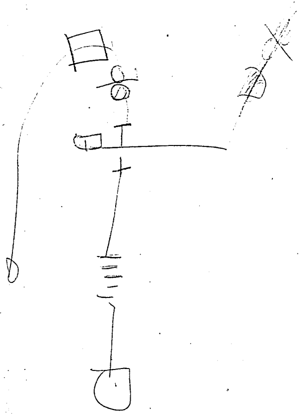
185 Ok Belcher

187 - OK - Big Belcher - Relay
Hold for Chili

182 OK Belcher Relay
Hold for Chili

175 - OK - Belcher Relay
Hold for Chili





174 - OK Belcher but
[illegible] 1st class Relay
[illegible]

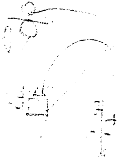
183 - OK [illegible] Hat
ok pack

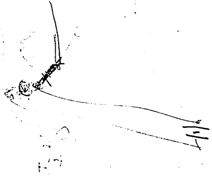
177 - OK [illegible] Hat
Relay - [illegible]

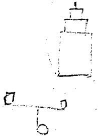
195 - OK [illegible] Pack.

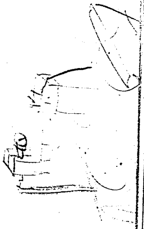
174 - [illegible]

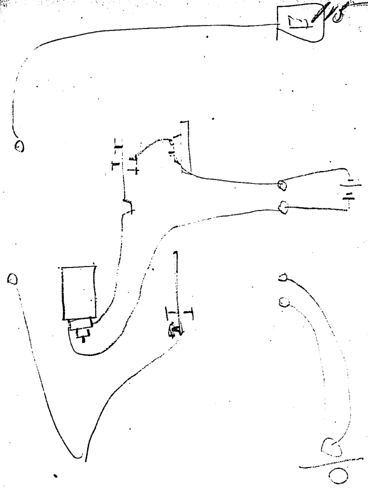
197 - ~~[illegible]~~ [illegible]
[illegible] [illegible]
Batch [illegible]
[illegible]
OK, Pack.











208-ok Mod [illegible] P[illegible] ok

204-Ok B[illegible] #5 [illegible]

196-Red Hat [illegible] ok

192-ok [illegible]

191- B[illegible] Ok

193-ok [illegible]

20[illegible]-ok [illegible]

199-ok [illegible]

201-ok [illegible]

198-ok Belcha -

207- Pres. on Star Called on primary duty [illegible]
4X - Member Belcha

210 ok Belcha

2[illegible] - ok [illegible]

213 - [illegible]

209 - ok B[illegible]

2[illegible]3 - [illegible]

1[illegible]

120

121

Hot wet.

Bergman No. A, Wet OK Pack
No B, 3 brushes

fill until water stays
chalk — a [illegible] wet.
Belcher not OK. [illegible]

C — [illegible]
a — delay [illegible]
need check OK now

General Debility Wet.

D — Bergman Wet OK Pack

E — Berg Wet OK Pack.

F Berg Wet OK Pack.

— Berg — Wet OK Pack

Berg Wet OK Pack

Berg Wet
Rutton in Trans [illegible] O Cathey Guess

Dec 1937 [illegible]

122 OK for England.

179 O.K.
143 O.K.
[illegible] O.K.
178 O.K.
131 O.K.
M O.K.
J O.K.
197 O.K.
E O.K.
H O.K.
D O.K.
I O.K.
C O.K.
B O.K.
A O.K.

123

J - Berg WEt O.K. Pack

K - Berg Wet wire box
in the Pack

L Berg WEt O.K. Pack

M, wet = [illegible] O.K. Pack [illegible]

121 - wet - O.K. Pack

178 - wet - O.K. Pack

N wet O.K. Pack

180 wet.

143 wet O.K. Pack

170 wet O.K. Pack.

O wet Left Hand

160 Has old chain. Hard for test tonight.

Left Handed Push button back
up and down.

---

13 Potatoes with baking
half an hour in oven
130°

Left Hand Push Button
[illegible] [illegible] [illegible].

[illegible] Raised check,
[illegible] Lever from [illegible] [illegible]
transmitter probably

Increased delicacy

Fault for [illegible]

Bermans Telephone
G.A.S. Met Nov 11th

538
537 OK Belcher Pack
558 K Belcher Pack
569 Low Low
554 OK Belcher Pack.
~~545~~ ~~[illegible]~~ Low ~~[illegible]~~
524 OK Belcher Pack
561.
567 OK Belcher Pack
514 OK Belcher Pack
518 Low
529 ~~Low~~ OK ~~Belcher~~ Belcher Pack
568 OK Belcher Pack
556
525 ~~Low~~ OK Belcher Pack
541 Low ~~[illegible]~~ [illegible]
551
552 OK Belcher Pack
~~560~~

November 15th

557 OK Belcher Pack
570 OK Belcher Pack
532 ~~Low~~ OK Belcher Pack
566 Low.
549 ~~am OK~~ Belcher Pack
534.
571 OK Belcher Pack
527 OK Belcher Pack
555
516 OK Belcher Pack
519 Belcher Pack.
565
540 Belcher Pack
517
542 ~~Dirty~~ Belcher Pack

Bergmans Telephones
Test Nov. 15/79

561 Look at circuit
543
550 Substituted for 145 Standard
513 The shaft sheet binds in its bearings (very bad)
530
539
548
541 Receiver Belcher ~~Bergmann's~~
523 Chalk sleeve too snug in bearings
563 Low.
542 ~~Low.~~ Low
513 Good Pack.
555 Belcher Pack.
586 Low.
160 OK Belcher Pack

Bergmans Telephones
Test Nov 17/79

520
560 OK Belcher Pack
526
573
531
546 OK Belcher Pack
539
553
515
547
53
521
535
559 Belcher Pack

Upsch bell, Belchers transmitter
Pad

Bergman Telephone

[illegible] by J. W. E.
[illegible] 26 77

603 Low
~~578 Low~~
~~577 Low [illegible] 26 77~~
586 OK Belcher Pad
597 OK Belchers Pad
575 OK Belchers Pad
~~585 OK Belchers Pad~~
574 OK Belchers Pad
596 OK Belchers Pad
154 OK Belchers Pad
594 OK Belchers Pad
584 Low

577 OK Belcher Pack

530 OK Belcher Pack

578 ~~Low~~ OK Belcher Pack.

587 Low.

145 OK Belcher Pack

563 OK Belcher Pack

588 OK Belcher Pack

~~544 Chalk bad holes on~~

584 Low Uneven
597 OK Belcher Pack.
544 OK Belcher Pack.
545 OK Belcher Pack
591 OK Belcher Pack
599 OK Belcher Pack
592 OK Belcher Pack
581 OK Belcher Pack.

Low Low probably a error
in the Original
601 OK Good Pack.
592 OK Belcher Pack.
603 OK Belcher Pack.
569 OK Belcher Pack.
580 Low.

2469
10
24690

2469
14
9876
2469
34566

102)251900.(2469
204
479
408
710
612
980
918
62

2469.

100

10

110

75
45
[illegible]
5325
57125.41

5725
44
22900
2290
22900
110)251900(2290.
220
319
220
990
990
00

110
22900
2290.
251.9

2290
10
22900

300) 996600 (3322
900
966
900
660
600
600
600

3322
10
1

3322
10
33,220

30.

1 300
2 150
4 75
37 1/2
8 18.75
16 9,375
32

150
150
150
750
150
22650
44
90600
90000
996600 (4983
200) 99660
800
1966
1800
1660
1600
600
600

200

44 200

40000

600) 1760,000 (2933

1200

5600

5400

2000

1800

2000

1800

200

4 [illegible] 400

(3

24 × 42

6.

[illegible]

2400 3000

1200,000

24.

Nov 17 -

Bergmans insts wd by Jim Seymour

B. 551 - OK

No 6 old relay something wrong Trans -

---

180 ours = ~~Relay - Nothing~~

~~Bergmans inst = arm [illegible] by~~ all OK

---

174 Belcher OK for Chile

181 all OK " "

173 all OK " "

177 all OK " "

182 all OK " "

44 Chalk (Relay) Sounds Wheezy

~~Bells~~

552 very low NG

535 very low " "

544 little louder but NG

551 low NG

556 OK but not 1st cla Belcher

529 OK Belcher

568 OK Belcher

518 very low NG.

554 OK Belcher

558 OK Belcher

545 NG low

514 Receiver low Transmitter low

561 Big belcher transmitter buzled

567 NG very low

524 NG very low

569 Batty poor stuff NG

537 all OK belcher

538 NG low

212 belcher Rec OK Trans no good get new one

524 new chalk put in by J. F. O. Nov 18/79

567 new chalk wet by J. F. O. Nov 18/79

538 new chalk by J. F. O. Nov 18/79

538 Groove of pen to wide
and has sharp edges

552 [illegible] pen [illegible]

552 O K Belcher

520 O K Belcher

19th =

Telephones Passed by T. &c.

~~582 O.K. Belcher Pack~~ OK TAE

~~520 O.K. Belcher [illegible]~~ OK TAE

525
545 Penn Reset

560 Penn makes wide track

564 Penn reset

546 Penn Rest wants [illegible]

19th = Nov.

526.B OK Belcher. Pack

551.B OK Belcher Pack.

552 OK Belcher Pack

520 OK Belcher Pack

538 OK Belcher Pack

536 - OK Belcher Pack

531 OK Belcher Pack:

532 OK Belcher Pack

518. Pen sideways - Low -

573 OK Belcher Pack

515 OK Belcher. Pack

523 OK Belcher [illegible]

521 OK Belcher Pack

570 - Nata Belcher - Reset pen
& think it will be OK

528 OK Belcher Pack.

534 OK Belcher Pack.

561 - OK Belcher Pack

519 - Pen released ([illegible])

566 - Low - W[illegible]

571 - Low [illegible] Patrol[illegible]

557 - Low

533 - OK Belcher Pack

547 - OK Belcher Pack

535 - OK Belcher Pack

555 - Okeesey

517 Ok Belcher Pack

543 - Ok Belcher Pack

553 - Ok Belcher Pack

540 - Low

565 Ok Belcher Pack

559 - Low

556 - Ok Belcher Pack

564 Worm N. E.
Co not find
kept let Bergman
see it. T. F.

550 Tesch, Rueben
let Bergman see

264 Low
584 Low
625 Low
245 Loud but wheezy pin set wrong
260 OK Pack ✓
685 Low
647 Low
624 OK Pack ✓
673 OK Pack ✓
626 Low
616 OK Pack ✓
702 OK Pack ✓
609 OK Pack ✓
618 OK Pack ✓
634 OK Pack ✓
595 OK Pack ✓
580 Low
655 Low

---

649 OK Pack ✓
246 OK Pack ✓
266 Wheezy
239 OK Pack ✓
261 OK Pack ✓
231 OK Pack ✓
258 Low
255 OK Pack ✓
238 OK Pack ✓
252 Low
235 OK Pack ✓
247 Wheezy
242 Low
267 Wheezy
259 Wheezy
254 Loud but wheezy
248 Low

283 Wheezy
229 Low
253 Loud but wheezy
233 Loud but wheezy
228 Loud but wheezy
245 OK Pack ✓
232 Low
236 Loud but wheezy
224 crank bad
234 Loud but wheezy
256 Low
257 Low
237 Low
265 OK Pack ✓
240 Low + wheezy X Page 196
244 Low
241 OK Pack ✓
684 Low

691 Low
663 Low
688 OK. Pack
704 Low
654 Low
666 Low
684 Very Low
645 Very Low

240 OK Pack
248 OK Pack
244 OK Pack
237 OK Pack
689 OK. Pack
645 OK Pack
668 OK Pack
654 Pen not set right
704 OK Pack
663 OK Pack
691 OK Pack
684 No chalk
640 OK Pack
633 OK Pack
257 OK Pack

256 Chalk set wrong Belcher
234 OK Pack
224 ~~OK~~ Belcher crank hand
236 OK Pack
232 OK Pack
228 OK Pack
233 OK Pack
253 OK Pack
229 OK Pack
223 OK Pack
254 OK Pack
259 OK Pack
267 OK Pack
242 Pen set way [illegible]
247 OK Pack
262 OK Pack

635	OK Pack
258	crank bad
266	Pen set wrong
631.	Low
580	Low
626	OK Pack
685	OK Pack
625	Pen set wrong
264	Pen set wrong
647	New chalk
714	OK Pack
655	Pen. new set
245	OK Pack
584	Low

Telephone Book

675 OK Pack ✓

701 Low
725 Low

680 OK Pack ✓
654 Whussey
632 OK Pack ✓
613 OK Pack ✓
628 OK Pack ✓
627 OK Pack ✓
646 OK Pack ✓
639 Low handle bad spring
708 OK Pack ✓
683 OK Pack ▽
580 Low
614 OK Pack ✓
676 OK Pack ✓
671 Low handle hard ○
625 Low /wait till it dries/

589 Pin set wrong ○
698 OK Pack ✓
227 Whussey ○
665 handle mechanism loose ○
669 OK Pack ✓
672 OK Pack ✓
659 Low -
606 Handle mechanism loose ○
660 OK Pack ✓
667 OK Pack ✓
664 Low
710 OK Pack ✓
697 New spring
637 OK Pack ✓
674 OK Pack ✓
681 OK Pack ✓
620 OK Pack ✓

705 OK Pack ✓
622 OK Pack ✓
712 Handle mechanism loose
678 OK Pack ✓
696 OK Pack ✓
661 Low
625 OK Pack ✓
706 OK Pack ✓
686 Handle mechanism loose
605 OK Pack ✓
692 Handle mechanism loose
656 OK Pack ✓
694 Handle mechanism loose
579 OK Pack ✓
243 OK Pack ✓
584 OK Pack ✓
242 OK Pack ✓

647 Low
621 Handle mechanism loose
636 OK Pack ✓
709 Spring broken
583 OK Pack ✓
700 OK Pack ✓
642 OK Pack ✓
641 OK Pack ✓
615 OK Pack ✓
644 Wheezy
258 OK Pack ✓
687 OK Pack ✓
677 OK Pack ✓
286 Handle loose OK
224 OK Pack ✓
266 OK Pack ✓

617 OK Pack ✓
619 OK Pack ✓
679 OK Pack ✓
682 OK Pack ✓
695 OK Pack ✓
264 Bar handle
690 OK Pack ✓

665 Low
271 OK Pack
227 OK Pack
275 OK Pack
584 Low
225 Low handle bad
659 OK Pack
701 Low
606 OK Pack
712 OK Pack
686 OK Pack
697 OK Spring
621 Low
649 Low
661 Low
272 OK Pack
644 Whussey

639 Handle loose spring
671 OK Pack
709 bad transmitter spring
256 OK ~~Pack~~ spring
264 OK ~~Pack~~ spring
676 OK spring
694 OK spring
580 Low
284 OK Pack
625 Low
629 red chalk & P.[illegible]
651 Low
654 Low
6

-621 - Bow -
-665 O.K. Pack -
-709 O.K. Pack
-737 O.K. Pack
-274 O.K. Pack
279 O.K. Pack
286 - O.K. Pack
278 O.K. Pack
276 O.K. Pack
-270 O.K. Arm Spring weak
=273 - O.K. Pack -
-283 O.K. Pack
-287 - O.K. Pack -
-282 - O.K. Pack -
-280 - O.K. Pack - Loose Arm
-277 - O.K. Pack -
-650 - O.K. Pack -
-288 - O.K. Pack -
-290 - O.K. Pack -

-29[illegible] - O.K. Pack -
-811 - O.K. Pack -
-285 - O.K. Pack -
-291 - O.K. Pack -
-281 - O.K. Pack -
-289 - O.K. Pack -

-735- O.K. Pack -
-805- O.K. Pack -
-812- O.K. Pack -
-747- O.K. Pack - - Spring
-750- O.K. Pack -
738- O.K. Pack -
808- O.K. Pack -
815 - O.K. Pack -
- 731- O.K. Pack -
- 733- O.K. Pack -
-742- Low -
-900- Low -
-602- Low -
798- O.K. Pack -
-269- O.K. Pack -
718- O.K. Pack - Spring -
-776- Low -
-762- O.K. Pack -
-866- Low -
784- Low, Bad Transmission
& Spring

-800- Low -
-756- Low - Spring -
-747- O.K. Pack -
-621- Low -
-764- Low -
-758- O.K. Pack -
-866- Low -
-787- Low -
-776- O.K. Pack - Spring -
-629- Low -
-644- Low -
-784- O.K. Pack -
-790- Low -
-768- Low - Spring -
-789- O.~~K. Pa~~ck - Low
-230 O.K. Pack -
-770- Low -
-749- O.K. Pack -
-692- Low -
-813- O.K. Pack -
-796- Low -
-792- Low -

-continued

795- O.K. Pack, New Spring
746- Low-
739- Low-
629- Low-
684- Low-
814- O.K. Pack-
786- O.K. Pack-
753- Low-
816- O.K. Pack-
810- Low-
781- Low-
801- Low-
734- Low-
742- O.K. Pack-
725- Low-
722- O.K. Pack-
768- O.K. Pack-
773- O.K. Pack-
774- O.K. Pack-
225- Low-
778- Low-
727- O.K. Pack-

Note,

752- Wet by Edison for
test, [illegible] Tuesday Dec 2

4

775- Wet on each side by
Edison, Tuesday Morning
Dec 22 77 at 4 o'clock

139. Bad Chalk-

792- O.K. Pack.
768- O.K. Pack -
648- O.K. Pack -
745- O.K. Pack - .
800- O.K. Pack -
735 - Low -
612 - Low
644- O.K. Pack -
760- O.K. Pack -
621- Low + Wheezy.
866- O.K. Pack -
639- Low -
787- Low
790- Low -
728- O.K. Pack. -
789- Wheezy -
796- Low -
692- Low -
770- O.K. Pack.
775- O.K. Put in Rack -
752- O.K. Pack -
759- O.K. Pack -
761- O.K. Pack -

13 Shipped 13

778- O.K. Pack -
753- Low
629- Low
781 O.K. Pack
684 O.K. Pack
225 O.K. Pack
801 O.K. Pack
734 O.K. Pack
725 O.K. Pack
746. O.K. Pack
734 Low 21
714 O.K. Pack
589 O.K. Pack
692 Put in Rack
753 O.K. Pack
724 O.K. Pack
612. Low
756 Low
634 Low
647 Low

12 Shipped

218

~~806~~

790 - O.K. Pack - 1½ Crack
795 - O.K. Pack - Spring
7[illegible] - O.K. Pack.
629 - O.K. Pack - Spring
692 - O.K. Pack -
806 - O.K. Pack
775 - O.K. Pack, paint -

7 Shipped

219

814 - [redacted] O.K. Pack ✓
903 - [redacted] O.K. Pack ✓
819 - O.K. Pack - ✓
62 O.K. Pack ✓
71 Rusted
631 O.K. Pack - Spring ✓
662 - O.K. Pack - ✓
755 - O.K. Pack - ✓
786 O.K. Pack - ✓
793 O.K. Pack ✓
61 O.K. Pack ✓
87 O.K. Pack ✓
80 O.K. Pack ✓
21 O.K. Pack

13 Shipped

January 2 1880

6081-√x O.K. Pack
791-√x O.K. Pack
714-√x O.K. Pack -
789- O.K. Pack -
639x√ O.K. Pack -
736- O.K. Pack - Storing
769-√x O.K. Pack -
779-√x O.K. Pack -
720-√x O.K. Pack -
780-√x O.K. Pack -
804- Sent Transmit
756- O.K. Pack. Spring -

~~To Records~~

~~1364~~
Returned 998

Expts. To Be Tried
by J. Seymour for T.A.E.

6 [illegible] wet by J. S. Dec. 30.

6 chalks [illegible] one minute each
[illegible] Water and allowed
to dry [illegible] under a bell
jar and then put under into
the phones numbers (794) (891) (846)
(926) (763) (753)

Expt No 3
[illegible] on [illegible]
[illegible] with one [illegible]
on [illegible]
brush all [illegible] wet on [illegible]
[illegible] but [illegible]
on the [illegible]. In teleph.
No (817) ~~(891) (846) (926~~
(612) (857) (726) (723)

Wet 6 by soaking them
½ minute and then drying
them [illegible] under a bell
jar and polish as soon
as put [illegible] Expt no 1

Expt no 2
The same as Expt 1 [illegible]
to [illegible] 24 hours [illegible]
~~put~~ [illegible]
phone.

Expt No 3
Wet 6 [illegible] sh
[illegible]
on [illegible]
track.

Expt. 4 Wet 6 with
2 brushes full on the whole
face [illegible] 47 (or 17½ [illegible]

890 to be cut ✓
878 to be cut ✓
817 to be cut ✓
846 to be cut ✓
654 to be cut ✓
807 to be cut ✓
849 to be cut ✓
757 to be cut ✓

600
728
7

Chalks wet on both ends
and not on the trash.

739
652

Chalks that wer low and wer wet a little more.

225
810
684
629
778
746
770
792
992
796
768
789
728
790
644
639
687
666
664
621
556

800
621

Rewet on ends but not on the track. [illegible]

724

22 24 24
23 24 24
16 24 96
18 24 144
19 96
98

Experiments to be tried

Wet one on outside without wetting the track

Wet one without wetting the ends

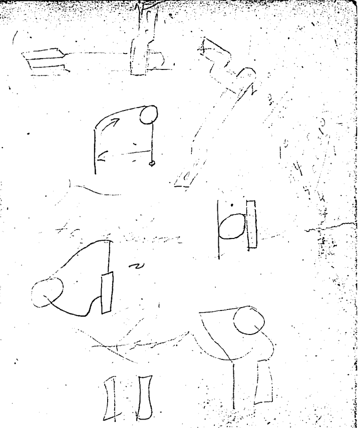
266

Chalks wet by J. L.
on the ends and not on
the middle (1.17$\frac{4}{5}$)

799
755
~~799~~
71
86
631
662
629
713
1
50 ←
787 ←
61 ←

J. E. Vreeland
E. Vreeland

D W Crane
D Crane
D W Crane

D W Crane